What is claimed is:

1. A method of digitally canceling interference on a received signal within a satellite payload comprising adaptively canceling interference on the received signal using an interference reference feedforward signal.

2. A method as in claim 1 further comprising subtracting an counter-interference signal from the received signal to form a desired signal.

3. A method as in claim 2 further comprising digitally processing said desired signal to generate said feedforward interference reference signal.

4. A method as in claim 3 further comprising correlating said interference reference feedforward signal to said desired signal to generate an error signal.

5. A method as in claim 4 wherein adaptively canceling interference on the received signal further comprising generating said counter-interference signal based on said error signal to cancel said interference.

6. A method as in claim 5 wherein adaptively canceling interference further comprises iteratively canceling interference on the received signal until said error signal equals zero.

7. A method as in claim 1 wherein said adaptively canceling interference further comprises digitally and accurately replicating the interference.

8. A method as in claim 1 further comprising simultaneously digitally canceling interference on a plurality of received signals.

9. A method as in claim 1 further comprising sequentially digitally canceling interference on a plurality of received signals.

~~10.~~ A method of digitally canceling interference on a received signal within a satellite payload comprising:

receiving a communication signal having interference;

converting said communication signal into the received signal;

subtracting a counter-interference signal from the received signal to form a desired signal;

digitally processing said desired signal to form an interference reference feedforward signal;

correlating said interference reference feedforward signal to said desired signal to generate an error signal; and

adaptively canceling interference on the received signal based on said error signal by generating said counter-interference signal to cancel said interference.

~~11.~~ A satellite communication system comprising:

a first antenna for receiving a communication signal;

an analog-to-digital converter (ADC) electrically coupled to said first antenna, said ADC converting said communication signal to a received signal;

a satellite payload circuit comprising a first input, a second input, and an output, said first input is electrically coupled to said ADC;

said satellite payload circuit digitally processing said received signal to form an interference reference feedforward signal; and

a feedforward signal path electrically coupling said output to said second input, said feedforward signal path transferring said interference reference feedforward signal from said output to said second input.

12. A system as in claim 11 wherein said satellite payload circuit further comprises:

a subtractor electrically coupled to said ADC, said subtractor subtracting a counter-interference signal from said received signal to form a desired signal;

a digital processor electrically coupled to said subtractor, said digital processor generating said interference reference feedforward signal from said desired signal;

a correlator electrically coupled to said subtractor, said correlator comparing said interference reference feedforward signal to said desired signal to generate an error signal; and

a controller electrically coupled to said correlator and said subtractor, said controller adaptively canceling interference on said received signal based on said error signal.

13. A communication system comprising:

a first antenna for receiving a communication signal;

an analog-to-digital converter (ADC) electrically coupled to said first antenna, said ADC converting said communication signal to a received signal;

a subtractor electrically coupled to said ADC, said subtractor subtracting a counter-interference signal from said received signal to form a desired signal;

a digital processor electrically coupled to said subtractor, said digital processor generating said interference reference feedforward signal from said desired signal;

a correlator electrically coupled to said subtractor, said correlator comparing said interference reference feedforward signal to said desired signal to generate an error signal; and

a controller electrically coupled to said correlator and said subtractor, said controller adaptively canceling interference on said received signal based on said error signal.